



# ***New Ideas for the Millennium***

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## ***Parametric Estimating Panel***

***Presented By:***

**DCMA Participants:**

***David L. Mabee, DCMA-OCB  
Egils Vigants, DCM Pratt &  
Whitney***

**Industry Participants:**

***Bruce Fad, PRICE Systems, LLC***

- **Introduction**
- **1999 DCMA study**
- **Pratt & Whitney process**
- **Should cost with parametric models**
  - **Galorath Representative**
  - **Price Systems, Inc. Representative**

# Why we studied parametrics

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**Determine the feasibility of developing independent Government estimates for spare parts prices**

- **Improve UCA definitization timeliness**
- **Facilitate price analysis for Price-Based Acquisition & Commercial Item Contracts**
- **Reduce reliance on supplier-furnished cost data**

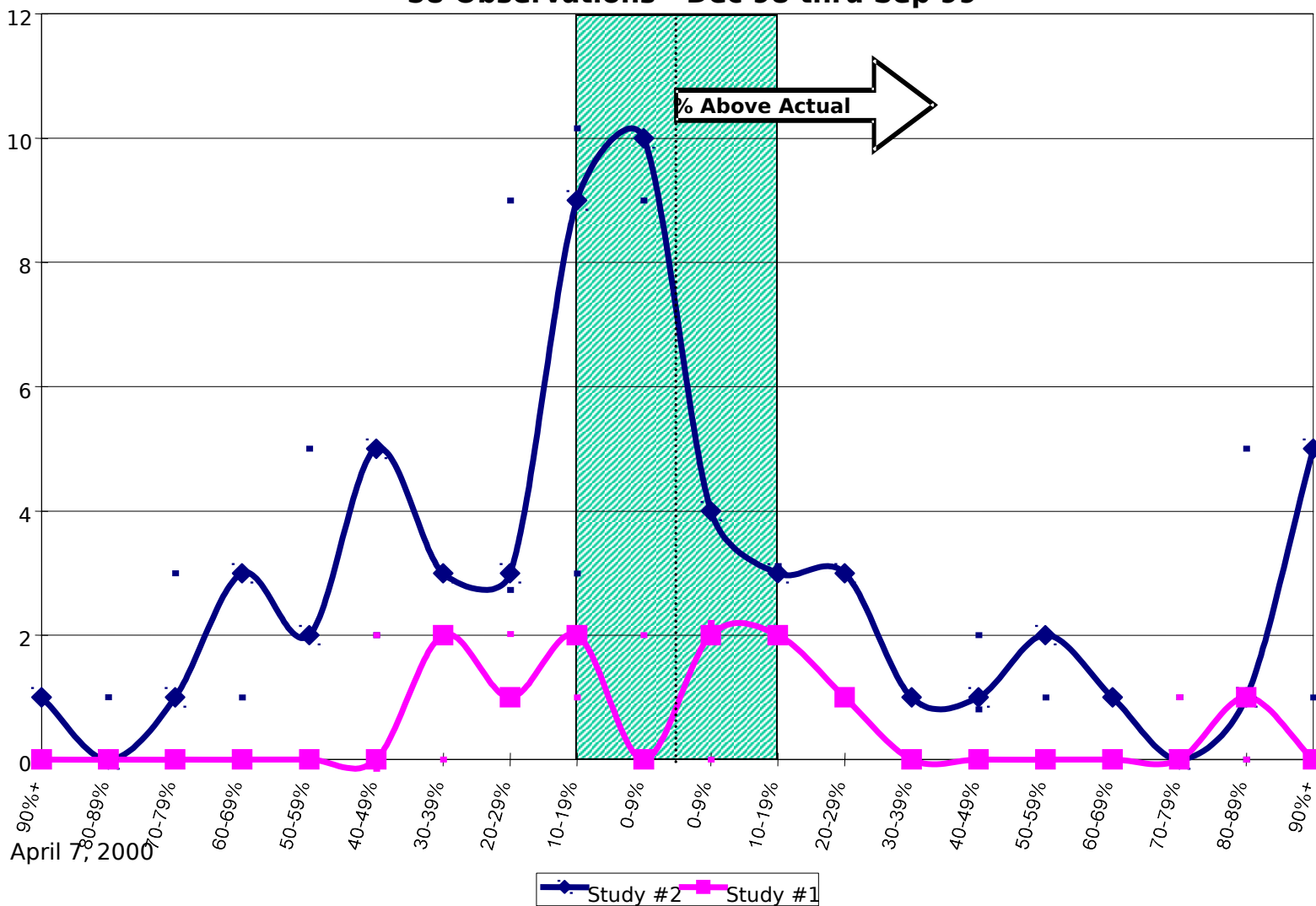
- **222 parts tested**
- **Actual costs obtained for 58 parts (two sites)**
- **Participating sites were: SEER-H**

Boeing Helicopters	Boeing Seattle
Chicago-Rockford	Boeing St. Louis
Pratt & Whitney-East Hartford	Northrop-Grumman Hawthorne
Raytheon	Raytheon-Hughes Tucson
Syracuse	Twin Cities

# Parametric Study Results

## Frequency Distribution: Percent Variance from Actuals

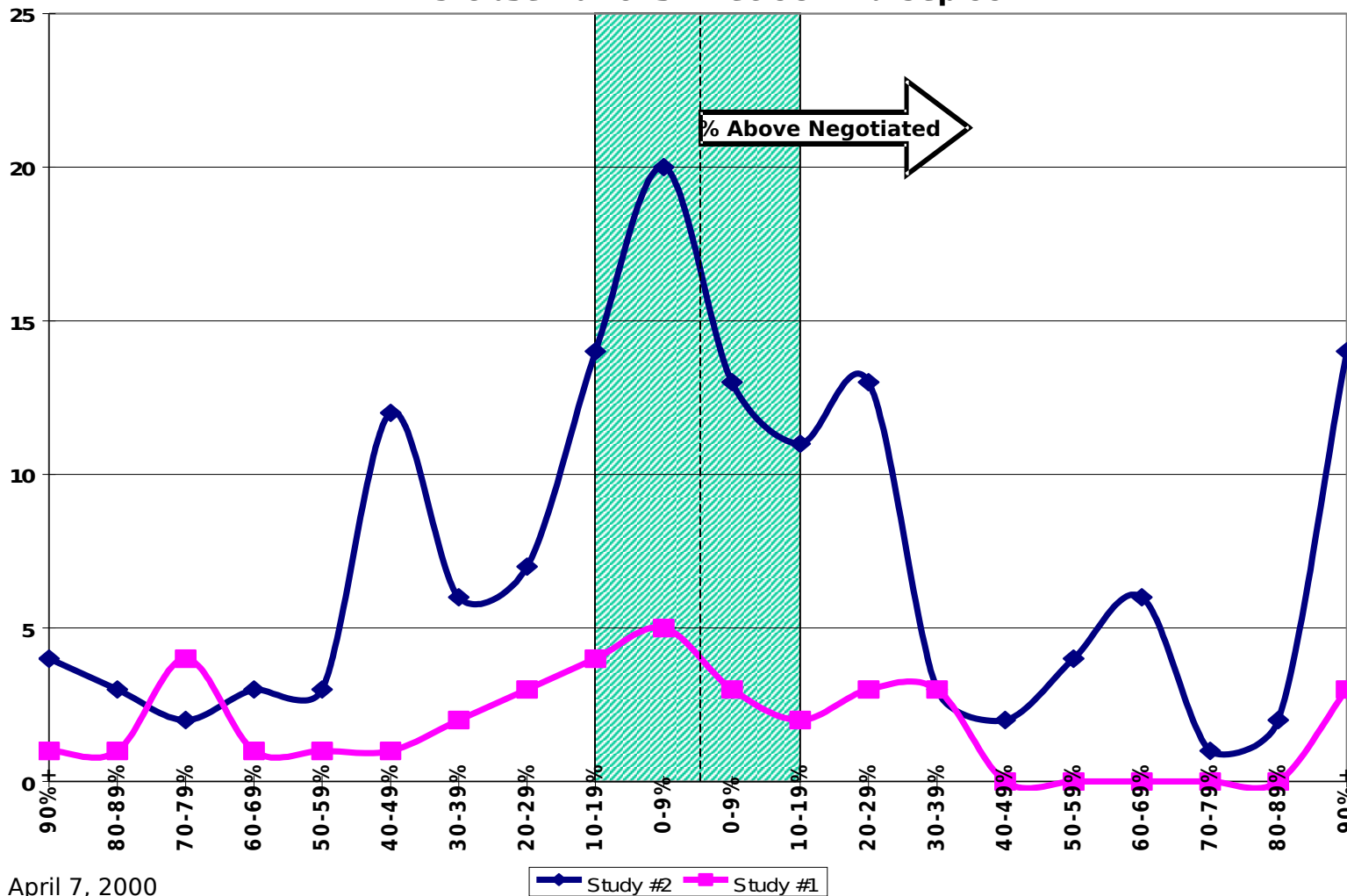
58 Observations - Dec 98 thru Sep 99



# Parametric Study Results

## Frequency Distribution: Percent Variance from Negotiated

143 Observations - Dec 98 thru Sep 99



April 7, 2000

# Why did our results vary?

- **Limited calibration**
  - ***Calibration data is generally not available***
  - ***Accounting systems often do not collect costs for spare parts***
- **Use industry averages versus company data**
  - ***Company labor & overhead rates may vary significantly from industry norms***

***...when properly calibrated and validated, (the parametric) methodology generates excellent results.....and demands careful attention to database parameters, applications and model selection..***

***- J.L. Robbins &***

**V.F. Smith**

**1999 Joint**

# What have we learned?

- **Use the right tool for the job!**
- **Change in culture**
- **Access to information is a key challenge**
- **Specialized models needed in some cases**
- **Parametrics may be the only tool in some cases**



# What have we learned?

- **Use the right tool for the job!**
  - ***Web-based procurement history can facilitate price analysis***
    - **Over 80% of items covered in parametric study have adequate pricing history**
    - **Services offer critical pricing information:**
      - ◆ ***Contract numbers***
      - ◆ ***Quantities***
      - ◆ ***Prices paid***
      - ◆ ***Date procured***
      - ◆ ***Technical characteristics***
    - **Obtained subscription to Haystack**

# What have we learned?

- **Change in culture**
  - ***Shift in philosophy***
    - **Greater emphasis on product knowledge**
    - **Emphasis on cost estimating versus proposal evaluation**
    - **Larger role for engineer**
  - ***Limited experience***
    - **Industry users often have 10-15 years experience**
    - **2-5 years needed to develop mature capability**
      - ◆ ***Most organizations develop capability incrementally***
      - ◆ ***Outside consultants can facilitate transition***
      - ◆ ***Large time investment to calibrate and validate models***

- **Access to information is a key challenge**
  - ***Better access to pricing history should reduce need for independent cost estimate***
  - ***Key information needed to populate models is not readily available in many cases***
    - **Time consuming to collect information**
    - **Weight and volume is biggest problem**
      - ◆ ***Sometimes estimated from drawings***
      - ◆ ***Parts may be measured & weighed (though usually not in stock)***
    - **Some technical information (materials, coatings, etc.) available through FEDLOG**
      - ◆ ***But not a reliable source***

# What have we learned?

- **Specialized models are needed in some cases**
  - *Task specific models are used for software, electronics, and other areas*
  - *This issue became apparent at two sites*

# What have we learned?

- **Parametrics may be the only tool in some cases**
  - ***New Items - Strength of parametrics is ability to establish price with a reasonable degree of accuracy when cost history is not available***
  - ***Frequently used by industry to identify cost drivers and conduct sensitivity***

***The parametric technique is most commonly used in the definition and early design stages of projects when there is insufficient information to perform a detailed estimate....attention is usually focused and concentrated on the true cost drivers....***

**- Joseph**

**Hamaker, CCE/A**

**Cost Estimator's**

## **Pratt & Whitney process**

- **Focus on product not organization (market value)**
- **Calibrate & validate model using price history**
  - ***Use industry average labor/overhead rates***
  - ***Develop range of complexity factors for parts families across industry***
- **Forward estimate using known input values**
  - ***Input technical characteristics***
  - ***Standardize model inputs...MPI, Learning Curve***
  - ***Normalize quantity and schedule***
  - ***Conduct sensitivity analyses to:***

## *Pratt & Whitney process*

- **Twenty-one part numbers evaluated**
  - *44 acquisition prices over the last 10 years*
  - *Sample included GE & PW parts*
- **Established range of calibrated complexity factors for turbine section & stages**
- **Twelve part prices estimated using the test complexity factors (validation)**
- **Validation estimates ranged from 12.6% above to 6.9% below negotiated prices**
  - *Overall, the delta was “zero”*

# Where do we go from here?

## Deployment strategy.

- **Incremental deployment**
  - *Parametrics have limited utility in some CAOs*
  - *Develop deployment plan*
- **Workforce development**
  - *Develop training plan*
- **Information systems**
  - *Develop IT deployment plan*
- **Policy/guidance**
  - *Develop guidebook and training material*
- **Publicize achievements**
  - *NCMA, ISPA, SCEA*
  - *Pricing conferences*